NASA Procedural Requirements

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COMPLIANCE IS MANDATORY

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Subject: NASA Program and Project Management Processes and Requirements

Responsible Office: Office of the Chief Engineer

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APPENDIX D. Project Plan Template

D.1 Instructions

The Project Plan is an agreement between the Center Director (if applicable), Program Manager, and Project Manager. It defines, at a high level, the scope of the project, the implementation approach, the environment within which the project operates and the commitments of the program and project. The Project Plan is used by the Governing Program Management Committee (GPMC) in the review process to determine if the project is fulfilling its agreement. The Project Plan shall be consistent with the Program Plan. The Project Plan is updated and approved during the project life cycle if warranted by changes in the stated commitments or Level-1 requirements.

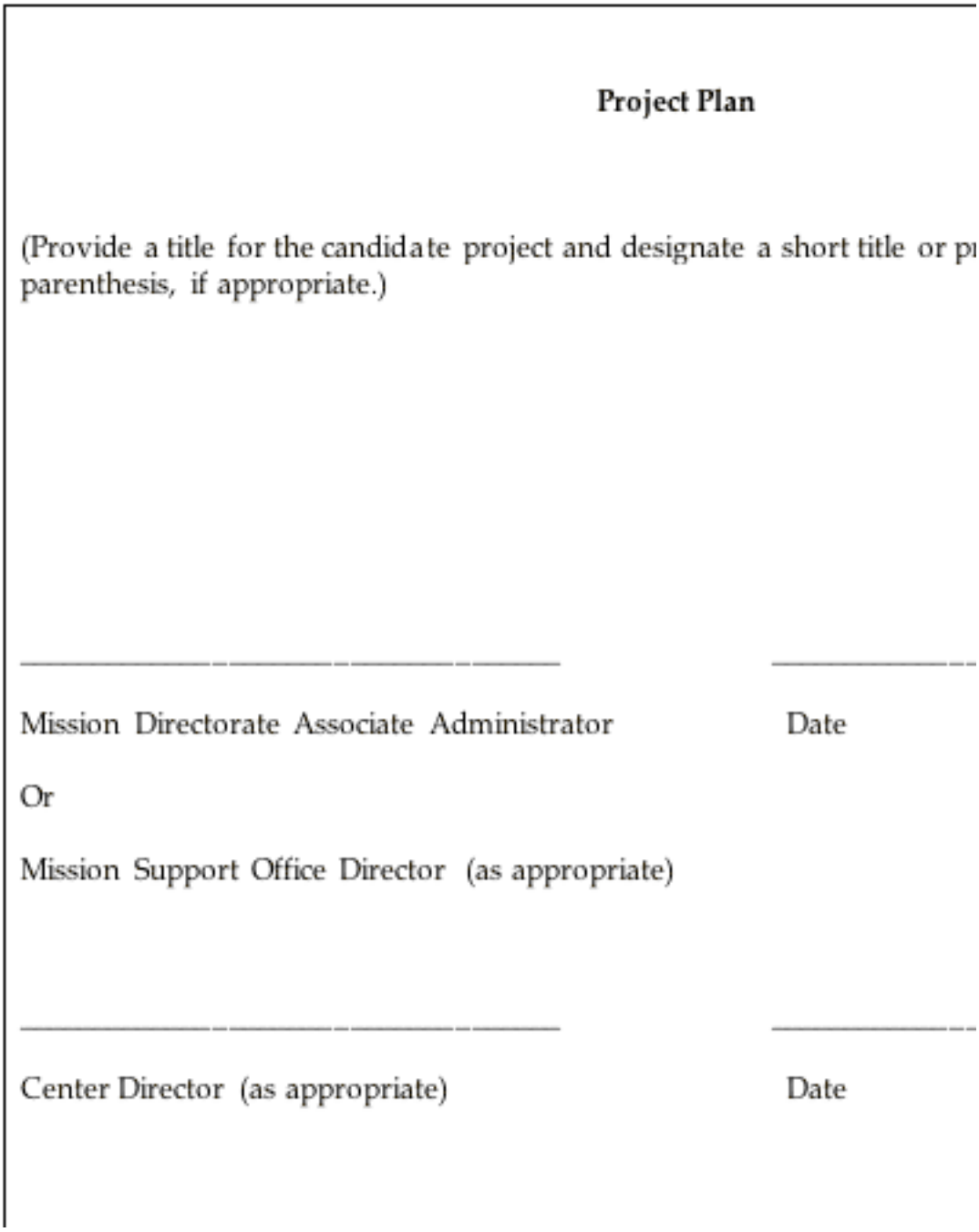
This template Project Plan is for all projects and all sections should be included. If a section is not applicable to a particular project, indicate by an "NA" and provide rationale.

A preliminary Project Plan is due at the preliminary NAR or System Requirements Review at the end of Phase A. An updated version is due at the NAR or Preliminary Design Review per Appendix G, and the final is due by the approval gate.

The planning efforts called out in this document designated as a "plan" are not necessarily intended to be a separate plan; (however, is not precluded). These requirements may be addressed in this document, or as part of another document with a summary of the approach in this document. A planning effort called out as a "Plan" is a stand-alone document and should be included in the Project Plan as a summary with reference to the control document number and title of the document. Note that the plans included in this section are not an all inclusive set of Plans required for a given project.

The required signatures are the Center Director (if applicable), Program Manager, and the Project Manager. Other signatures may be added if applicable.

D.2 Title Page



Project Plan

(Provide a title for the candidate project and designate a short title or pr
parenthesis, if appropriate.)

_____ _____

Mission Directorate Associate Administrator Date

Or

Mission Support Office Director (as appropriate)

_____ _____

Center Director (as appropriate) Date

Figure D-1 Project Plan Title Page

D.3 Template

PROJECT PLAN [PROJECT NAME]

1.0 Part I: Project Overview

1.1 Introduction

The project is identified by a NASA program, PCA, and/or unique Work Breakdown Structure (WBS) number and has an official title. Provide a reference to the governing Program Plan.

Provide a brief general history and summary to include the project's purpose, goals, overall approach, and timeframe. Identify previously conducted projects, studies, proposals, concept study reports, experiments, related activities or any other information appropriate to providing a perspective on the project.

Describe participation, if any, of other NASA Centers as well as other government agencies, and industry or

international partners. Provide key project dates, such as launch, arrival or other event, and end of mission. Refer to the section of the Plan containing the Project schedule.

Briefly describe the process for change control of the Project Plan. Include the approval authority for changes to the Plan.

1.2 Objectives

State the specific project objectives, performance goals, and their relationship to the program objectives and goals. Performance goals should be stated in an objective, quantifiable, and measurable form. Include technology objectives and related performance goals, if applicable, also stated in objective, quantifiable, and measurable form.

Include project-specific high-level requirements.

State the full mission success criteria clearly and concisely in a form suitable for objective verification and validation. State the minimum mission success criteria associated with the high-level project requirements that, if not met, trigger a possible Termination Review.

1.3 Mission Description

Provide a brief overview of the mission, indicating important characteristics of the mission, such as mission trajectory and a brief description of the phases and events on the mission timeline. Drawings, figures, charts, etc., may be used for clarification.

Identify major constraints affecting system development (e.g., cost, launch window, required launch vehicle, mission planetary environment, fuel/engine design, foreign partners, etc.)

1.4 Customer And Stakeholder Definition And Advocacy

State the customers and stakeholders of the project (e.g., PI, science community, technology community, public, education community, Program and Mission Directorate sponsor) and the process to be used to ensure customer advocacy.

1.5 Project Authority

Identify the Center where the Project Manager resides and other Center's responsibilities, and the GPMC responsible for the oversight of the project. Provide a chain of accountability and decision path that outlines the roles and responsibilities of the Project Manager, Program Manager, Center Director, and other authorities as required.

1.6 Management

Describe the project management structure consistent with the project WBS, including organization and responsibilities, its integration into the program management structure, and NASA Center participation. Include clear lines of authority and reporting; illustrate the organization graphically. Identify all significant interfaces with other contributing organizations. Describe the process for problem reporting and subsequent decision making, clearly describing the roles and responsibilities of all organizations. Identify specific management tools to support management in planning and controlling the project. Describe any use of special boards and committees. Address any requirement for a NASA Resident Office including duties and authority.

1.7 Governance Structure

Describe the governance structure based on the project category (see Section

1.5.4). Describe the process that the Project will follow to communicate to the GPMC, Mission Directorate, Mission Support Office, and Program Manager. Include clear lines of authority and reporting, including frequency of reporting.

1.8 Project Requirements

Document the project requirements. Identify KPPs and success criteria, as a flow down from the program requirements. This includes the allocation of these requirements and success criteria among the systems to be developed, both hardware and software. Describe the process by which project requirements are validated for compliance with program requirements. Describe the process for controlling changes to these requirements.

1.9 Technical Summary

Present a technical description of the project. This includes the systems to be developed (hardware and software), facilities, flight plans, operations and logistics concepts, and planned mission results analysis and reporting.

a. System(s)
b. System operations concept
c. System constraints
d. Ground systems and support
e. Facilities
f. Mission results analysis and reporting
g. End of life cycle

1.10 Implementation Approach

The implementation approach of the project should be included (e.g., in-house, NASA Center, contractor prime), as well as a project WBS and a WBS dictionary. Make-or-buy plans and trade studies should also be included.

a. Implementation approach
b. Project summary WBS

1.11 Program/Project Dependencies

Other NASA, U.S. agency, and international activities, studies, and agreements are summarized with emphasis on their effect on the program.

a. Related activities and studies, e.g., space communications, launch services, crosscutting technology b. Related non-NASA activities and studies

1.12 Logistics

Describe the project's logistics requirements, for example, spares provisioning, shipping and handling equipment, transportation, user manuals, simulators, training and training materials, and supporting personnel.

2.0 Part II: Project Baseline

2.1 Schedules

Document the project's Integrated Master Schedule for all major events, independent reviews, and other activities throughout the life cycle of the project. Include approval dates for principal project documentation, lifecycle transitions, major reviews, program-controlled milestones, and significant contract milestones. Identify lower level schedules to be developed and maintained.

For ATD, Project Managers are encouraged to identify alternative development paths in order to maximize the probability of success.

2.2 Resources

a. Funding Requirements: Document the initial LCCE consistent with the project WBS, schedule, and performance parameters to form the project estimate baseline. Present a funding requirements chart that includes the same elements as for the acquisition summary. Indicate the NOA in full cost real-year dollars for the prior, current, and remaining fiscal years. The displayed detail should cover major elements of cost (typically reflecting at least at the second level of the WBS or its equivalent). (For more information on full cost and practices, see Volume 7 of the NASA Financial Management Requirements.)
b. Institutional Requirements: Present the infrastructure requirements (use or development of real property/facilities, aircraft, personal property, information technology) for the entire project throughout its life cycle. The business case includes full life cycle cost (LCC) (including operations, sustainment and disposal); benefit estimates; alternative and sensitivity analyses; and risk assessment. Present the workforce requirements. Include full cost civil service workforce requirements on the providing organizations for the prior (e.g., actuals), current, and remaining years.
c. Facility Requirements: Identify means of meeting infrastructure requirements through synergy with other programs and projects, thus avoiding costly duplication of support facilities and capabilities. Identify any

necessary upgrades or new developments, including those needed for environmental compliance.

2.3 Acquisition Management

Document the integrated acquisition strategy that allows the project to meet its mission objectives. Provide summary information on the Acquisition Plan, including procurement items (such as engineering design study, hardware and software development, mission and data operations support); type of procurement (competitive, AO for instruments); type of contract (cost-reimbursable, fixed-price); source (institutional, contractor, other Government organizations); procuring activity; and surveillance.

For ATD, only Category I and Category II projects are required to complete this section.

2.4 Performance

Describe the project specific KPPs and establish quantitative values (goal and threshold values) for each to be achieved at each milestone. The relationship may be in the form of a matrix that show the KPP range (threshold and goal) and the TRL to be achieved at each major demonstration.

3.0 Part III: Subplans

3.1 Communications Plan

Describe the communications plan for fostering effective (upward and downward) communication of critical management, technical, risk and safety information. Define the relationships among various project elements within the project structure and clearly state the responsibilities for problem reporting and subsequent decision making. Define the relationships and interactions with all stakeholders, team members, and supporting organizations.

3.2 Control Plan

All technical performance, risk, cost, or schedule parameters specified as requiring approval by the Administrator, the MDAA, Center Director, or Program Manager, should be identified. Describe the project EVM implementation strategy. Examples include funding by year, threshold KPPs, success criteria, program requirements, project objectives, requirement deviation or waivers, management structure, and major program/project documentation. Identify the thresholds associated with each parameter that could cause a change request. Describe the configuration management approach that the project team will implement. Reference the project Configuration Management Plan if applicable.

3.3 Risk Management Plan

Summarize the risk management approach to be used for the project, including appropriate actions to mitigate risk and project plans. Also identify primary risks. A stand-alone Risk Management Plan should be developed that includes the content shown in NPR 8000.4, Risk Management Procedures and Requirements.

3.4 Technology Strategy Or Insertion

3.4.1 Strategy: Identify the NASA crosscutting or other technology thrusts to be utilized by the project as well as the sources of the technologies. Describe how the project will remove remaining technology gaps, including maturation, validation, and insertion plans, quantifiable milestones, decision gates, and resources required. Describe how and when the project will evaluate the feasibility, readiness, cost, risk, and benefits of the new technologies. Also provide alternative development strategies for technologies that do not mature as expected. Identify distribution restrictions on the software, hardware, or data.

3.4.2 Insertion: For ATD, describe how the technology end item deliverable (product or service) will transition to application or user adoption (i.e., a technology transfer strategy). Demonstrate close interaction with the application community, and provide an exit strategy following technology transfer.

3.5 Cooperation And Commercialization

Describe all agreements, memoranda of understanding, barters, in-kind contributions, and other arrangements for collaborative and/or cooperative relationships. List all such agreements (the configuration control numbers and the date signed or projected dates of approval) necessary for project success. Include all agreements concluded with the authority of the Project Manager and reference agreements concluded with the authority of the Program Manager and above.

a. NASA agreements, e.g., space communications, launch services

p. Non-NASA agreements:

1. Domestic
2. International

Identify opportunities for establishing partnerships with private industry, academia, or other governmental organizations to conduct dual use research, develop mutually beneficial technologies, and transfer results into NASA for mission use and the private sector for commercial application.

3.6 Safety And Mission Success Plan

Safety and mission success planning should be included either as a section of this Project Plan or as a separate document. Address the activities and steps to be taken to ensure safety of the public, the NASA astronauts and pilots, the NASA workforce, and NASA's high-value equipment and property.

Address both hardware and software aspects of the project, and identify all activities, such as safety, reliability and maintainability, quality assurance, environmental related design and test including orbital debris mitigation, project surveillance, failure detection, isolation, and recovery, failure reporting/resolution, and hazard analysis and hazard mitigation which are used to ensure the success and safety of the mission.

3.7 Environmental Management Plan

Identify the documentation and schedule of events associated with environmental compliance considerations (NEPA and other requirements). This includes a preliminary Environmental Evaluation and Record of Environmental Consideration (REC) signed by the Center NEPA Document Manager) which may lead to an EA and/or an Environmental Impact Statement. Refer to section 3.2.1.2 k, Complete the Environmental Management Plan.

3.8 Systems Engineering Plan

Describe the systems engineering scope and approach to be implemented on the project. Identify the technical standards that are applicable to the project and any intended.

3.9 Verification And Validation

Describe the project's approach to verification and validation for the assurance of project success. This should address requirements for hardware and software verification and validation, as well as software IV&V.

3.10 Reviews

Summarize the approach to a continuum of reviews for the Project life cycle. Provide the names, purposes, content, and timing of the critical milestone reviews. Describe the process for selecting the IA team and the communication requirements of the results. Explain the reporting requirements for program and project reviews. Reference the Project Review Plan, as appropriate.

3.11 Configuration Management Plan

Describe the structure of the CM organization and tools to be used. Identify the methods and procedures to be used for configuration identification, configuration control, interface management, configuration traceability, and configuration status accounting and communications. Describe how CM will be audited and how contractor CM processes will be integrated with the project.

3.12 Education And Public Outreach Plan

Describe planned efforts and activities to improve science literacy by engaging the public in understanding the project, its objectives, and benefits. Summarize plans to stimulate interest in science, engineering, and technology through mission-related outreach activities.

3.13 Termination Review Criteria

Provide the technical, scientific, schedule, cost, and other criteria, which will be utilized in the consideration of a termination review.

3.14 Knowledge Capture

Summarize the approach to knowledge capture on the project as well as the methods for contributing knowledge to other entities and systems. This includes the development and maintenance of an electronic project library.

3.15 Waivers/Deviations Log

Identify those requirements for which a waiver or deviation has been requested and approved consistent with project characteristics such as scope, complexity, visibility, cost, safety, and acceptable risk and provide rationale and approvals. Identify those variances requiring Independent Technical Authority approval.

3.16 Change Log

Document changes to the Project Plan.

3.17 Appendices

NPR 7120.5 Compliance Matrix
CADRe (Category I and II Flight and Ground Support Projects)

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